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EXAMINER	
LEUNG, CHRISTINA Y	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,647	YANG ET AL.	
	Examiner	Art Unit	
	Christina Y. Leung	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☒ Claim(s) *8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 April 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4-12-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 23 April 2002. These drawings are acceptable.

Claim Objections

2. Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicants are required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Regarding claim 8, Examiner respectfully notes that the limitations recited by the claim ("wherein the echelle grating includes a transparent substrate and the light passes through the substrate") appear to be already fully recited in its parent claim (claim 6).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 9 and 10 each recite "the faceted beam steering element," but there is insufficient antecedent basis for these limitations in the claims because claims 1, 2, 3, 6, and 8, on which they directly and indirectly depend do not previously recite "a faceted beam steering element." Examiner notes that claim 7 appears to recite a beam steering element, but claim 7 does not recite a substrate, which is also required by claims 9 and 10.

Given the objection to claim 8 discussed above, Examiner respectfully suggests that Applicants may amend claim 8 to depend on claim 7 (instead of on claim 6) in order to provide antecedent bases for the limitations in claims 9 and 10.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 23, 26, 27, 36, 38, 39, 43-46, and 48 are rejected under 35 U.S.C. 102(e) as being anticipated by He (US 6,768,841 B2).

Regarding claim 1, He discloses an optical communication channel interleaver 30 (Figure 3) for operating on an optical signal comprising multiple optical channels having odd and even channel frequencies, the optical communications signal comprising at least one optical beam, the interleaver comprising:

a first port 31;

a second port 32a;

a third port 32b;

an echelle grating interleaving unit 33 disposed to diffractively couple light, having even channel frequencies, between the first port 31 and the second port 32a and light, having odd channel frequencies, between the first port 31 and the third port 32b (column 5, lines 13-38).

Regarding claim 23, He discloses that the even-channel light is diffracted in a first direction (i.e., toward port 32a) and the odd-channel light is diffracted in a second direction different from the first direction (i.e., toward port 32b; column 5, lines 24-58).

Regarding claims 26 and 27, He discloses that different even and odd channels are diffracted in respectively different diffraction orders (column 5, lines 1-67; column 6, lines 1-42).

Regarding claim 36, as similarly discussed above with regard to claim 1, He discloses a method for de-interleaving an input light beam having a plurality of channel frequencies uniformly spaced by a frequency difference (Figure 3), comprising:

directing the input light beam (from port 31) to an echelle grating 33 (column 5, lines 13-38);

diffracting with the echelle grating odd channel frequencies in a first beam at a first angle to the input light beam and even channel frequencies in a second beam at a second angle to the light beam, the second angle different from the first angle (column 5, lines 1-58); and

selecting at least one of the odd and even beams as an output beam (output from ports 32a and 32b; column 5, lines 29-35).

Regarding claim 38, He discloses passing at least one of the input beam, the first beam, and the second beam propagates through a grating substrate (component 30 shown in Figure 3, which includes grating 33, comprises an integrated substrate; column 4, lines 65-66; column 5, lines 1-26).

Regarding claim 39, He discloses that the grating is a reflection grating (column 5, lines 55-58).

Regarding claims 43 and 44, He discloses that light in the first beam at different even and odd channel frequencies is diffracted by the echelle grating into respectively different diffraction orders (column 5, lines 1-67; column 6, lines 1-42).

Regarding claim 45, He discloses a method for interleaving a first beam with odd channel frequencies (from port 32b) and a second beam with even channel frequencies (from port 32a) to form an output light beam having odd and even channel frequencies uniformly spaced by a frequency difference (Figure 3), comprising:

directing the first beam to an echelle grating 33 at a first angle to a grating surface normal;

directing the second beam to the echelle grating 33 at a second angle to the grating surface normal, the second angle being different from the first angle;

diffractively coupling the first beam and the second beam via the echelle grating to an output beam (column 5, lines 1-58; column 6, lines 55-59).

Examiner respectfully notes that although He describes the principles of the disclosed interleaving apparatus in column 5, lines 1-58 in terms of demultiplexing/de-interleaving an input signal having multiple wavelengths into two outputs, He also discloses that the apparatus is bi-directional and may be used to combine/interleave two inputs into one output in the reverse direction (column 2, lines 21-30; column 6, lines 55-59).

Regarding claim 46, He discloses propagating at least one of the first beam, the second beam and the output beam through a grating substrate (component 30 shown in Figure 3, which includes grating 33, comprises an integrated substrate; column 4, lines 65-66; column 5, lines 1-26).

Regarding claim 48, He discloses that the echelle grating is a reflection grating (column 5, lines 55-58).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 28-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al. (US 6,925,262 B2) in view of He.

To avoid confusion, Examiner notes that throughout this Office Action, "He" is only used to refer to the US 6,768,841 B2 reference by He and is never used as a pronoun referring to Ooi et al. or any other reference cited in other rejections below.

Regarding claim 28, Ooi et al. discloses an optical fiber communications system (Figures 4, 6, and 25) comprising:

an optical transmitter unit 2 (shown in detail in Figure 25) generating light in multiple optical channels having channel frequencies of $\nu_0 + m\,\Delta\nu$ where $\nu 0$ is the lowest frequency, $\Delta\nu$ is the channel separation, and m is an integer;

an optical detector unit 4 (shown in detail in Figure 6) detecting signals of the multiple optical channels; and

an optical communications network coupled between the optical transmitter unit 2 and the optical detector unit 4, the optical communications network including at least one optical fiber 6;

wherein at least one of the optical transmitter unit and the optical detector unit includes an optical interleaver coupled to the optical communications network (including interleaver 64 in detector unit 4 shown in Figure 6 and interleaver 172 in transmitter unit 2 shown in Figure 25; column 7, lines 49-53; column 12, lines 65-67; column 13, lines 1-7).

Ooi et al. further disclose that the optical interleaver 64 comprises a first (input) port, a second (output) port, and a third (output) port, wherein the interleaver couples odd channel frequencies from the input port to one of the output ports and couples even channel freuqneices from the input port to the other output port. Ooi et al. disclose that the optical interleaver 172 functions similarly in the reverse direction (between second and third [input] ports and a first [output] port). Ooi et al. further disclose that the interleavers 64 and 172 are coupled to the optical communications network by the first port and at least one of the second and third ports.

Ooi et al. are silent regarding the implementation details of the interleavers and do not specifically disclose that the interleavers are echelle grating interleaving units.

However, various ways of implementing an optical interleaver are known in the art, and He particularly teaches an echelle grating interleaving unit for use in a wavelength division multiplexing system such as disclosed by Ooi et al. (column 1, lines 8-32). He further teaches that the echelle grating interleaving unit is disposed to diffractively couple light, having even channel frequencies, between the first port and the second port and light, having odd channel frequencies, between the first port and the third port (column 2, lines 66-67; column 3, lines 1-56). Regarding claims 34 and 35 in particular, He discloses that light having different even and odd channel frequencies is diffracted by the echelle grating interleaving unit in respectively different diffraction orders (column 5, lines 1-67; column 6, lines 1-42).

Regarding claims 28, 34, and 35, it would have been obvious to a person of ordinary skill in the art to include an echelle grating interleaver as taught by He in the system disclosed by Ooi et al. as an engineering design choice of a way to implement the interleaver element already disclosed by Ooi et al. One in the art would have been particularly motivated to use an echelle grating interleaver as taught by He because it is advantageously smaller, less expensive, and easier to manufacture than other known types of interleavers (He, column 2, lines 50-59).

Regarding claim 29, Ooi et al. disclose at least one optical amplifier disposed in at least one of the optical transmitter unit, the optical network and the optical detector unit (such as amplifiers 12, 14, 22, 24, 32, and 34 shown in Figure 4).

Regarding claim 30, Ooi et al. disclose the first port (in interleaver 64 located in detector unit 4) is coupled to receive multi-channel light from the optical transmitter unit 2 and at least one of the second and third ports is coupled to transmit an output light beam for detection within the optical detection unit (Figure 6).

Regarding claim 31, Ooi et al. disclose the optical detector unit 4 includes a plurality of optical detectors 20 for detecting light having different channel frequencies and at least one wavelength division demultiplexing element 70, 72, 74, and 76 disposed between at least one of the second port and the third port and the plurality of optical detectors to direct light from the interleaver to the plurality of optical detectors (Figure 6).

Regarding claim 32, Ooi et al. disclose the second port (in interleaver 172 in transmitter unit 2)is coupled to receive light from an even-channel transmitter (including "optical transmitter #2" in Figure 25), the third port is coupled receive light from an odd-channel transmitter

(including "optical transmitter #1" in Figure 25), and the first port is coupled to transmit a multi-channel light beam.

Regarding claim 33, Ooi et al. disclose that at least one of the even channel transmitter and the odd channel transmitter includes a plurality of light sources (i.e., the optical transmitters #1-#44, which are divided into an odd channel transmitter array and an even channel transmitter array as shown in Figure 25) to generate light beams at the optical channel frequencies and at least one wavelength division multiplexing element 160, 162, 164, 166 being coupled between the plurality of light sources and the interleaver 172 to direct at least two beams to the interleaver (Figure 25).

9. Claims 2, 7, 11, 12, 17, 18, 21, 22, 24, 25, 40-42, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over He in view of Sappey et al. (US 6,304,692 B1).

Regarding claim 2, He discloses an optical communication channel interleaver as discussed above with regard to claim 1 but does not specifically disclose an optical coupling system. However, Sappey et al. teach an optical element that is related to the one disclosed by He including an echelle grating for diffractively coupling light (Figure 1). Sappey et al. further teach that the echelle grating may have a curved surface like the one disclosed by He (Sappey et al., Figure 11) or alternatively, have a straight surface and further include an optical coupling system including an optical focusing element 18 (Figure 1; column 4, lines 48-54; column 12, lines 7-11).

It would have been obvious to a person of ordinary skill in the art to include an optical coupling system as taught by Sappey et al. in the system disclosed by He in order to collimate and direct the output beams in a desired direction. One in the art would have been particularly

motivated to use the arrangement including an optical coupling system as taught by Sappey et al. in Figure 1 in order to redirect output light in a direction parallel to the input light as an engineering design choice depending on the arrangement and placement of other elements in the overall system.

Regarding claim 7, Sappey et al. further teach that the optical coupling system may include a faceted beam steering element (prism 68) and an optical focusing element (such as focusing mirror 74) as shown in Figure 8. Again, it would have been obvious to a person of ordinary skill in the art to include an beam steering element and an optical focusing element as taught by Sappey et al. in the system disclosed by He in order to collimate and direct the output beams in a desired direction depending on the arrangement and placement of other elements in the overall system.

Regarding claim 11, He discloses that the echelle grating 33 has a reflective diffractive surface (column 5, lines 26-58).

Regarding claim 12, He discloses an optical communication channel interleaver as discussed above with regard to claim 1 but does not specifically disclose a first optical coupling system between the first port and the grating and a second optical coupling system between the grating and at least one of the second and third ports. However, again, Sappey et al. teach an optical element that is related to the one disclosed by He including an echelle grating for diffractively coupling light (Figure 1). Sappey et al. further teach that the echelle grating may have a curved surface like the one disclosed by He (Sappey et al., Figure 11) or alternatively, have a straight surface and further include a first optical coupling system (mirror 46) and a second optical coupling system (mirror 54) (Figure 7; column 11, lines 1-15).

It would have been obvious to a person of ordinary skill in the art to include first and second optical coupling systems as taught by Sappey et al. in the system disclosed by He in order to collimate and direct the output beams in a desired direction depending on the arrangement and placement of other elements in the overall system.

Regarding claim 17, He discloses that the echelle grating includes a transparent substrate and light propagating between the first port and at least one of the second and third ports passes through the substrate (component 30 shown in Figure 3, which includes grating 33, comprises an integrated substrate; column 4, lines 65-66; column 5, lines 1-26).

Regarding claim 18, Sappey et al. further teach that an optical coupling system may includes a faceted beam steering element (prism 68) and an optical focusing element (such as mirror 64) as shown in Figure 8. Again, it would have been obvious to a person of ordinary skill in the art to include optical coupling systems comprising various optical elements as taught by Sappey et al. in the system disclosed by He in order to collimate and direct the output beams in a desired direction depending on the arrangement and placement of other elements in the overall system.

Regarding claims 21 and 22, He does not specifically disclose that the echelle grating 33 is oriented with a diffractive surface nearest the first port 31 or nearest the second and third ports 32a and 32b, although Figure 3 appears to suggest that the diffractive surface may be nearest the second and third ports. However, it is well understood in the art that the grating disclosed by He may be placed closer to the first port or closer to the second and third ports as an engineering design choice depending on the optical geometry and arrangement of elements in the system. Sappey et al. further generally suggests that various optical coupling systems may be used to

allow the ports and grating to be placed relative to each other in various arrangements as desired. It would have been obvious to a person of ordinary skill in the art to specifically orient the echelle grating in the system described He in view of Sappey et al. either nearest the first port or nearest the second and third ports as engineering design choice of a way to place the elements relative to each other as necessary depending on the placement of other elements in the overall system.

Regarding claims 24 and 25, He discloses an optical communication channel interleaver as discussed above with regard to claims 1 and 23 but does not specifically disclose that the first direction and the second direction form an angle at the echelle grating that is bisected by an optical axis or that light coupled to the first port propagates in a direction that is parallel to the optical axis at the grating. However, again, Sappey et al. teach an optical element that is related to the one disclosed by He including an echelle grating for diffractively coupling light (Figure 1). Sappey et al. further teach that the echelle grating may have a curved surface like the one disclosed by He (Sappey et al., Figure 1) or alternatively, have a straight surface and further include an optical coupling system including an optical focusing element 18 (Figure 1; column 4, lines 48-54; column 12, lines 7-11). In this arrangement taught by Sappey et al. in Figure 1, output beams form an angle at the echelle grating that is bisected by an optical axis and light coupled to the input port propagates in a direction that is parallel to the optical axis at the grating.

Regarding claims 24 and 25, as discussed above with regard to claim 2, it would have been obvious to a person of ordinary skill in the art to include an arrangement of input and output beams as taught by Sappey et al. in the system disclosed by He in order to redirect output light in

a direction parallel to the input light as an engineering design choice depending on the arrangement and placement of other elements in the overall system.

Regarding claims 40, 41, 49, and 50 He discloses a method as discussed above with regard to claims 36 and 45 but does not specifically disclose an optical coupling/focusing system or first and second optical coupling/focusing systems.

However, again, Sappey et al. teach an optical element that is related to the one disclosed by He including an echelle grating for diffractively coupling light (Figure 1). Sappey et al. further teach that the echelle grating may have a curved surface like the one disclosed by He (Sappey et al., Figure 11) or alternatively, have a straight surface and further include an optical coupling system including an optical focusing element 18 (Figure 1; column 4, lines 48-54; column 12, lines 7-11) or further include a first optical coupling system (mirror 46) and a second optical coupling system (mirror 54; Figure 7; column 11, lines 1-15).

Regarding claims 40, 41, 49, and 50, it would have been obvious to a person of ordinary skill in the art to include an optical coupling system or two optical coupling systems as taught by Sappey et al. in the method disclosed by He in order to collimate and direct the output beams in a desired direction depending on the arrangement and placement of other elements in the overall system.

Regarding claims 42 and 51, He discloses methods as discussed above with regard to claims 36 and 45 but does not specifically disclose bending the first beam and the second beam with a faceted beam steering element. However, again, Sappey et al. teach an optical element that is related to the one disclosed by He including an echelle grating for diffractively coupling light (Figure 1). Sappey et al. further teach that the system may include a faceted beam steering

element 68 for directing beams to/from the grating (Figure 8). It would have been obvious to a person of ordinary skill in the art to include a faceted beam steering element as taught by Sappey et al. in the system disclosed by He in order to collimate and direct the beams in a desired direction depending on the arrangement and placement of other elements in the overall system.

10. Claims 3-6, 8, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over He in view of Sappey et al. as variously applied to claims 2 and 12 above, and further in view of Wade (US 6,298,182 B1).

Regarding claims 3-5, He in view of Sappey et al. describe a system as discussed above with regard to claim 2 including an optical coupling system. Sappey et al. further teach that the optical coupling system may including an optical focusing element such as a lens 18 (Figure 1) or a prism 68 (Figure 8), but they do not specifically teach a lens array in addition to the optical focusing element.

However, Wade teaches a system related to the one described by He in view of Sappey et al., including a diffractive grating 18 and an optical coupling system with an optical focusing element 16 (Figure 1). Wade also teaches that the optical coupling system may further include a lens array with individual focusing elements associated with each port positioned to couple light in the ports to substantially collimated beams (column 12, lines 7-19).

Regarding claims 3-5, it would have been obvious to a person of ordinary skill in the art to include a lens in the first coupling system or a lens array in the second coupling system as taught by Wade in the system described by He in view of Sappey et al. in order to provide additional focusing of the light beams and ensure that light is accurately directed to each port.

Regarding claims 6 and 8, as well as claim 8 may be currently understood with respect to the claim objection discussed above, He discloses that the echelle grating includes a transparent substrate and light propagating between the first port and at least one of the second and third ports passes through the substrate (component 30 shown in Figure 3, which includes grating 33, comprises an integrated substrate; column 4, lines 65-66; column 5, lines 1-26).

Regarding claims 13-16, although He in view of Sappey et al. describe a system as discussed above with regard to claim 12 including first and second optical coupling systems (wherein the second system includes an optical focusing element comprising mirror 54), they do not specifically suggest that the first of two optical coupling systems is a lens or suggest a lens array with individual focusing elements associated with the second and third ports.

However, regarding claim 13 in particular, Wade teaches a system related to the one described by He in view of Sappey et al., including a diffractive grating 104 and first and second optical coupling systems 102 and 106 (Figure 11). Wade further teaches that the first coupling system is a lens.

Regarding claims 14-16 in particular, Wade also teaches that the second optical coupling system may include a lens array with individual focusing elements associated with each port positioned to couple light in the ports to substantially collimated beams (column 12, lines 7-19).

Regarding claims 13-16, it would have been obvious to a person of ordinary skill in the art to include a lens in the first coupling system or a lens array in the second coupling system as taught by Wade in the system described by He in view of Sappey et al. in order to provide additional focusing of the light beams and ensure that light is accurately directed to each port.

11. Claims 9, 10, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over He in view of Sappey et al. as applied to claims 7 and 18 above, and further in view of Chen et al. (US 5,652,681 A).

Regarding claims 9 and 10, as well as the claims may be understood with respect to 35 U.S.C. 112, discussed above, He in view of Sappey et al. describe a system including a beam steering element and echelle grating as discussed above with regard to claim 7. Regarding claims 19 and 20, He in view of Sappey et al. describe a system including a beam steering element and echelle grating as discussed above with regard to claim 18. They do not specifically suggest that the faceted beam steering element is attached to or integrally formed with a substrate of the echelle grating.

However, Chen et al. teach an optical system related to the one described by He in view of Sappey et al. including a diffractive grating and a faceted beam steering element (such as shown in Figure 4B). Chen et al. further teach that the faceted beam steering element may be attached to or integrally formed with a substrate of the grating as a design choice (column 2, lines 23-24; column 4, liens 10-29).

It would have been obvious to a person of ordinary skill in the art to attach or integrally form the grating and faceted beam steering element already described by He in view of Sappey et al. as taught by Chen et al. as an engineering design choice of a way to manufacture the two components. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

12. Claims 37 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over He in view of Barbarosa et al. (US 6,539,149 B1).

Regarding claims 37 and 47, He discloses methods as discussed above with regard to claims 36 and 45 including an echelle grating but does not specifically disclose that the echelle grating is a transmission grating. However, Barbarosa et al. teach a system related to the one disclosed by He including an echelle grating for combining and separating channel frequencies in an optical system (Figure 1). Barbarosa et al. further teach that the echelle grating is a transmission grating (column 2, lines 25-33). It would have been obvious to a person of ordinary skill in the art to implement the echelle grating disclosed by He as a transmission grating as taught by Barbarosa et al. as an engineering design choice of a way to implement the element that advantageously may be miniaturized and provide increased freedom of system design compared to a reflective echelle grating (Barbarosa et al., column 2, lines 11-33).

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Y Leung
Christina Y Leung
Patent Examiner
Art Unit 2633